

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 October 2003 (09.10.2003)

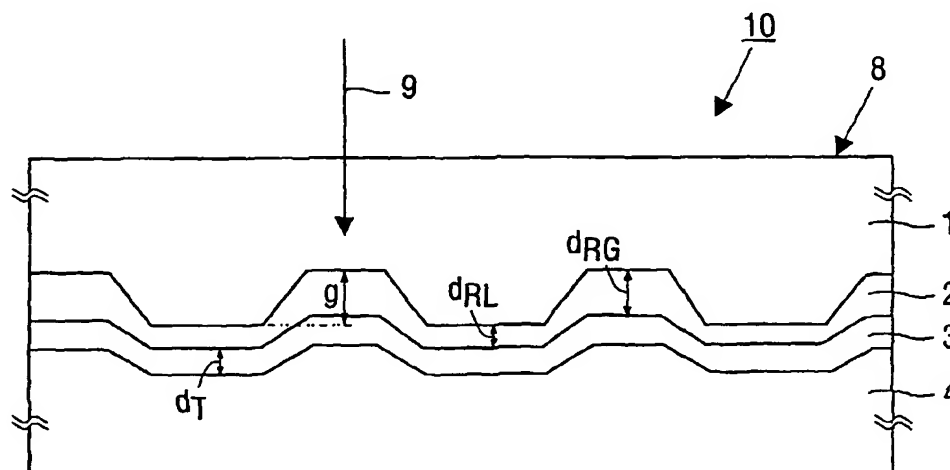
PCT

(10) International Publication Number
WO 03/083845 A1

- (51) International Patent Classification⁷: **G11B 7/007, 7/24**
- (21) International Application Number: **PCT/IB03/01377**
- (22) International Filing Date: **1 April 2003 (01.04.2003)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
02076286.0 **2 April 2002 (02.04.2002)** **EP**
- (71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]**;
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **MARTENS, Hubertus, C., F. [NL/NL]**; c/o Prof.. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: **DEGUELLE, Wilhelmus, H., G.**; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**
- Published:**
— with international search report

[Continued on next page]

(54) Title: **OPTICAL DATA STORAGE MEDIUM AND USE OF SUCH MEDIUM**



(57) Abstract: An optical data storage medium (10) for recording by means of a focused radiation beam (9) having a wavelength λ is described. The beam enters through an entrance face (8) of the medium during recording. The medium at least comprises a substrate (1), including a guide groove with a depth g . The guide groove is present at the side of the substrate opposite to the entrance face. A recording stack (2, 3) of layers is present adjacent the substrate (1) at the side of the guide groove. The stack includes a write-once recording layer (2) of a material having a complex refractive index $\tilde{n}_R = n_R - i \cdot k_R$ at the wavelength λ and having a thickness d_{RG} in the groove portion and a thickness d_{RL} in the portion between grooves. A non-metallic layer (3) of a substantially transparent material, is present adjacent the write-once recording layer (2). The groove depth g is in the range $(\lambda/655) \cdot 20 \text{ nm} < g < (\lambda/655) \cdot 140 \text{ nm}$ with λ expressed in nm. This range achieves a sufficient push-pull tracking signal and a sufficient modulation of recorded marks.

WO 03/083845 A1

WO 03/083845 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Int. Patent Application No

PCT/JP03/01377

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 1174869	A	23-01-2002	JP	2001344812 A	14-12-2001
			EP	1174869 A2	23-01-2002
			US	2002006105 A1	17-01-2002
<hr/>					
US 2001016242	A1	23-08-2001	JP	2001209974 A	03-08-2001
			TW	484134 B	21-04-2002
<hr/>					
US 5581539	A	03-12-1996	JP	8096416 A	12-04-1996
			JP	8102089 A	16-04-1996
			JP	8279187 A	22-10-1996
			CN	1140304 A	15-01-1997
			DE	19529621 A1	25-04-1996
			JP	3165354 B2	14-05-2001
			JP	8106653 A	23-04-1996
			JP	3376807 B2	10-02-2003
			JP	8321078 A	03-12-1996
<hr/>					
US 5213859	A	25-05-1993	JP	2739614 B2	15-04-1998
			JP	4370541 A	22-12-1992
			JP	5046995 A	26-02-1993
<hr/>					
EP 1128367	A	29-08-2001	JP	2002190139 A	05-07-2002
			EP	1128367 A2	29-08-2001
			US	2001021161 A1	13-09-2001
<hr/>					

INTERNATIONAL SEARCH REPORT

Int. Patent Application No.

PC 03/01377

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G11B7/007 G11B7/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 174 869 A (FUJI PHOTO FILM CO LTD) 23 January 2002 (2002-01-23) paragraphs '0001!-'0012!, '0051!, '0061!-'0063!; figures 1-3	1-10
X	US 2001/016242 A1 (ANDOO KEIKICHI ET AL) 23 August 2001 (2001-08-23)	1-5, 9, 10
A	paragraphs '0002!, '0010!, '0137!-'0152!; figure 1	6-8
X	US 5 581 539 A (HORIE MICHIKAZU ET AL) 3 December 1996 (1996-12-03)	1, 2, 10
A	abstract; figures 1, 3 column 1, line 6 - line 19 column 14, line 48 - column 17, line 40 column 19, line 58 - line 61	3-9
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

3 July 2003

Date of mailing of the international search report

16/07/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Hermann, R

INTERNATIONAL SEARCH REPORT

International Application No

PC 03/01377

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 213 859 A (AOI TOSHIKI ET AL) 25 May 1993 (1993-05-25)	1, 10
A	column 1, line 20 -column 3, line 9; figures 1, 2 ---	2-9
A	EP 1 128 367 A (TDK CORP) 29 August 2001 (2001-08-29) the whole document -----	1-10